

AULACIDAE (HYMENOPTERA) OF SRI LANKA

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Abstract.—Three species of Aulacidae from Sri Lanka are keyed, described, and illustrated: *Pristaulacus flavipennis* (Cameron), *P. signatus* (Shuckard), and *P. krombeini*, n. sp. Lectotypes for *Aulacus flavipennis* Cameron and *Aulacus magnificus* Schletterer are designated.

Key Words: Aulacidae, *Pristaulacus*, Sri Lanka, parasitoids

Three species of the family Aulacidae are known from Sri Lanka, all of which were among collections of the Smithsonian Ceylonese Insect Project of the 1970's. Two are species previously described from Sri Lanka, and one was undescribed. All are in the genus *Pristaulacus* Kieffer. About 20 species of Aulacidae have been described from the Oriental Region, and six of them are from northern India, but the species from Sri Lanka are distinct.

Species of Aulacidae are parasitoids of wood-boring Coleoptera (especially Cerambycidae and Buprestidae) and Hymenoptera (Xiphydriidae). Hosts are not known for the Sri Lankan species, and there are only two host records from southeastern Asia. *Pristaulacus beasoni* Turner, described from "Thano, Siwalik Hills, United Provinces, India" was "taken emerging from a Sal log" (Turner 1922), and a form described as *Pristaulacus nigripes* var. *duporti* Kieffer from Viet Nam was "Obtenu en abondance des larves de *Xylotrechus quadripes* [Cerambycidae]" (Kieffer 1921).

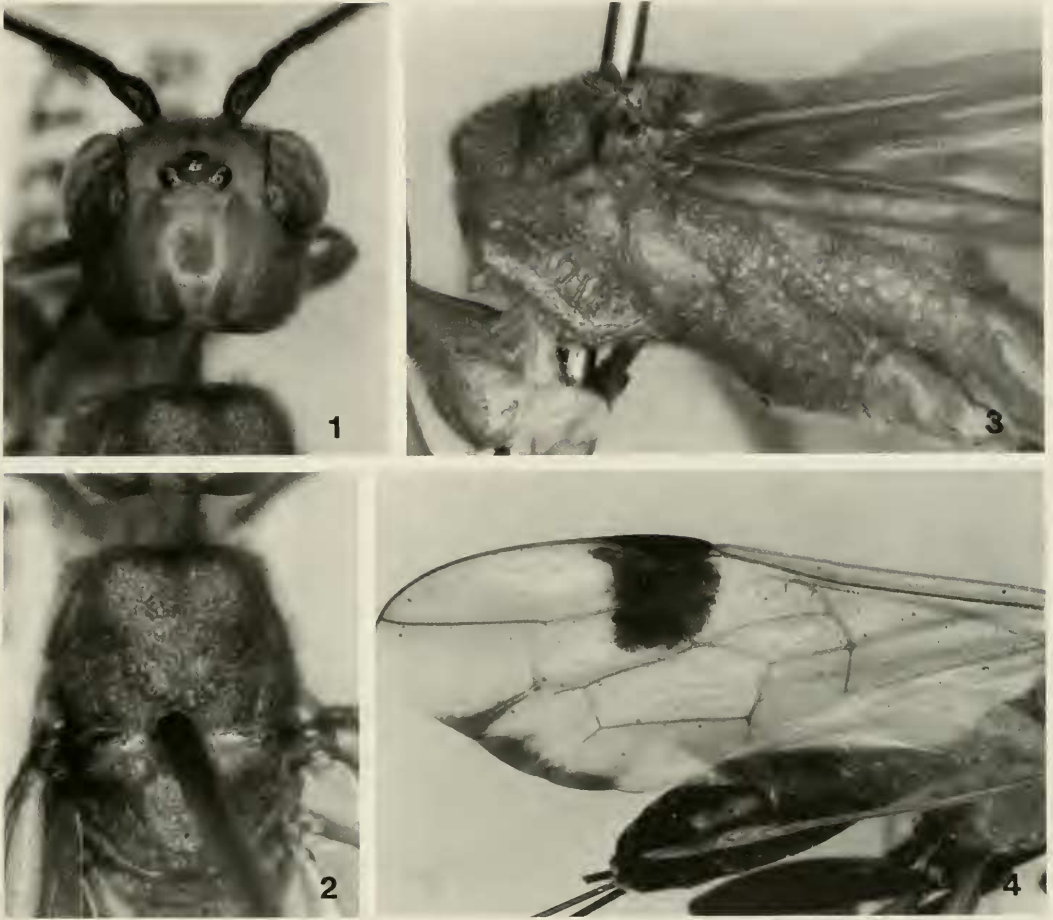
- spot below stigma and apical margin black (Fig. 4), or entirely blackish apical to stigma; mesonotum reticulate (Fig. 2); head in dorsal view elongate behind eyes (Fig. 1)
 *P. flavipennis* (Cameron)
- Head and body nearly all black, at most with only antennal scape and pedicel and fore- and midlegs reddish; forewing hyaline except for black substigmatal spot and black spot at apex or with anterior half black; mesonotum with transverse ridges (Figs. 6, 10); head in dorsal view short and narrowing behind eyes (Figs. 5, 9) 2
- 2. Forewing hyaline with infuscated spot below stigma (Fig. 8); antennal scape and pedicel and fore- and midlegs reddish; mesosoma with rather dense silvery hairs obscuring sculpture (Fig. 7); anterolateral lobes of mesonotum projecting forward in dorsal and lateral views (Figs. 6, 7) *P. signatus* (Shuckard)
- Forewing infuscated on anterior half, posterior part nearly hyaline (Fig. 12); head, body, and legs black, at most with mandible, tegula, and first metasomal segment reddish to brownish; mesosoma with relatively sparse hairs which do not obscure sculpture (Fig. 11); anterolateral lobes of mesonotum scarcely projecting forward in dorsal view (Fig. 10), projecting upward in lateral view (Fig. 11)
 *P. krombeini*, new species

KEY TO AULACIDAE OF SRI LANKA

- 1. Head, mesosoma, and legs mostly yellow; wings yellowish, forewing sometimes with

Pristaulacus flavipennis (Cameron)
(Figs. 1-4)

Aulacus flavipennis Cameron 1887: 134



Figs. 1-4. *Pristaulacus flavipennis*. 1, Head, dorsal. 2, Mesosoma, dorsal. 3, Mesosoma, lateral. 4, Wings. 1-3, Specimen from Kegalla District. 4, Lectotype of *P. magnificus*.

(♂).—Kieffer 1912: 371, 372 (in key, ♂ re-described).

Pristaulacus flavipennis: Turner 1919: 386 (syn.: *magnificus* Schletterer).—Hedick 1939: 8.

Aulacus magnificus Schletterer 1890: 495, 509, t. 22, f. 131 (♀, ♂).

Pristaulacus magnificus: Kieffer 1900: 338.—Kieffer 1902: 13.—Kieffer 1912: 380, 388 (in key; ♂ and ♀ re-described).

Female.—Length excluding ovipositor, 16–17 mm; forewing length, 14 mm; ovipositor length, 16–17 mm. Antenna black. Head yellow; apex of mandible black. Mesosoma yellow. Legs yellow with hindleg black except base and inner surface of coxa

(lectotype of *magnificus*) or first segment of trochanter, apical third of outer surface of tibia, and tarsus black (specimen from Kegalla District). Metasoma, except base and dorsal surface of first segment black (lectotype of *magnificus*) or orange with apical third of metasomal terga 2–6 blackish (specimen from Kegalla District); sheath black. Wings yellow; forewing with stigma black and large spot below stigma and apicoventral margin black (lectotype of *magnificus*; Fig. 4) or yellow with basal portion of stigma blackish and very faint darker spot below stigma (specimen from Kegalla District). Head from above elongated behind eyes (Fig. 1), shining and impunctate;

occipital carina very short. Propleuron shining and impunctate. Front margin of pronotum with a forward projecting triangular tooth just above its midlength; mesonotum with reticulate sculpture; front margin of mesonotum rounded, slightly lobate, not overhanging pronotum in lateral view (mesosoma as in Figs. 2, 3). Hindcoxa with distinct, coarse cross wrinkles laterally and posteriorly. Tarsal claws with 5 teeth (including apical tooth) and small basal lobe. Ovipositor length about $1.2\times$ forewing length.

Male.—Length, 15 mm. Color similar to lectotype female (*magnificus*), except smaller substigmatal spot of forewing, which is about half width of stigma and does not enter cubital cells (paralectotypes of *flavipennis* and *magnificus*), or with apex of forewing from base of stigma black (lectotype of *flavipennis*). Structure as for female.

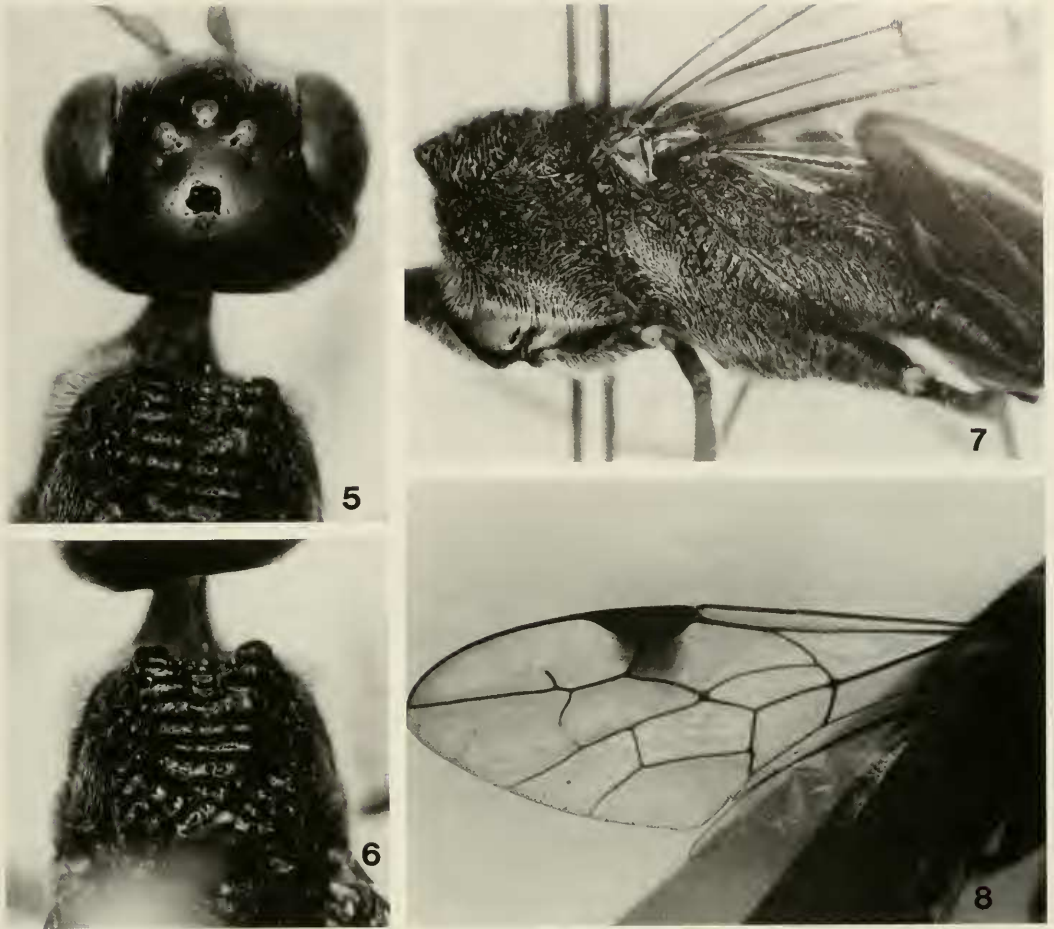
Records.—SRI LANKA: *Kandy District*, Dikoya, $06^{\circ}52'N$, $80^{\circ}30'E$ (types of *A. flavipennis*, spelled "Dekaya" by Cameron, 1887). *Kegalla District*, Kitulgala, Makande Mukalana, 3-4-11-1979, K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, S. Siriwardane, T. Gunawardane (1 ♀).

Types.—*Aulacus flavipennis* Cameron was described from two males from "Dekaya, Ceylon (Mr. George Lewis)" The specimens are in The Natural History Museum, London. The colors of the two specimens are slightly different, and Cameron called them "two forms of this species." One specimen is labeled "B.M. TYPE HYM 3.a.139", and this is hereby designated lectotype. The specimen lacks antennae, except for the basal three segments of the left antenna, hindlegs, and the metasoma, except for the first segment. The other specimen, the second "form" described by Cameron, lacks a type label and is considered a paralectotype.

Schletterer described *Aulacus magnificus* from a female and a male. He stated "Type im kaiserl. naturhistorischen Hofmuseum zu Wien (♀) und im königl. naturhistorisch-

en Museum zu Berlin (♂)." I have examined both specimens. The lectotype here designated is the female at the Naturhistorisches Museum Wien, Austria, labeled "Felder [spelling?], Ceylon, 1861," "magnificus det. Schlett.", and a red label "TY-PUS." The specimen is in fair condition with the following parts missing: right antenna beyond basal 4 segments, left antenna beyond basal 6 segments, right forewing, right foreleg, and left midleg. The male, a paralectotype, is at the Zoologisches Museum an der Humboldt-Universität zu Berlin, Germany, labeled "Ceylon, Nietner." "11548," "type" [red label], "magnificus Schlett.," and "Zool. Mus. Berlin." It is in good condition.

Discussion.—Even though there are color differences in the wings, metasoma, and hindlegs among the specimen from Kegalla District (female), the two forms of *A. flavipennis* Cameron (males), and the two specimens of *A. magnificus* Schletterer (female and male), I regard these as probable variation or sexual differences and treat them as the same species. The structure, especially sculpture, of all is similar. Much more study material will be necessary to determine if this is a species complex with perhaps more than one species involved. The specimen collected in Kegalla District is the palest: yellow with antenna, apex of mandible, apical portion of terga 2-6, sheath, ovipositor, first segment of hindtrochanter, apical third of outer surface of hindtibia, and all hindtarsus black, and the forewing is yellow with only a faint black area beneath the stigma. The lectotype of *A. flavipennis* has most of the metasoma and hindtibia black and the forewing with the apex beyond the basal end of the stigma mostly black. The paralectotype of *A. flavipennis* is similar to the lectotype except the forewing has a large spot below the stigma and apical margin black, and the lectotype female and paralectotype male of *A. magnificus* Schletterer are similar to the paralectotype of *A. flavipennis*.



Figs. 5-8. *Pristaulacus signatus*. 5, Head, dorsal. 6, Mesosoma, dorsal. 7, Mesosoma, lateral. 8, Wings.

Pristaulacus signatus (Shuckard)
(Figs. 5-8)

Aulacus signatus Shuckard 1841: 124.—Westwood 1844: 268.—Schletterer 1890: 509 (= ? *stigmaticus* Westwood).—Kieffer 1902: 12 (? *Aulacus*).—Kieffer 1912: 373 (repeats Shuckard's description).—Hedicke 1939: 19.

Pristaulacus signatus: Kieffer 1904: 455 (? *Pristaulacus*).

Female.—Length, excluding ovipositor, 9-11 mm; forewing length, 8-10 mm; ovipositor length, 8-10 mm. Black except for following: mandible dark orange with apex reddish brown; anterior half or less of clypeus sometime brownish; antennal scape or

scape and pedicel and fore- and midlegs beyond trochanters dark reddish; hindleg beyond coxae sometimes brownish; tegula brownish to reddish brown; first gastric segment sometimes partly pale reddish to orange. Wings hyaline; forewing with small infuscated spot below stigma (Fig. 8). Head from above short and narrowing behind eyes (Fig. 5); shining with widely scattered punctures and silvery hairs, these both more dense between ocelli and antennae; occipital carina short. Propleuron shining with scattered punctures, similar to top of head. Pronotum with a forward projecting triangular tooth just above its midlength; anterolateral angles of mesonotum protruding anteriorly in dorsal and lateral views and

mesonotum with coarse transverse ridges; dense silvery hairs somewhat obscuring sculpture, especially laterally (mesosoma as in Figs. 6, 7). Hindcoxa with distinct, coarse transverse wrinkles laterally and posteriorly. Tarsal claws with 4 teeth, including apical tooth, and small basal lobe. Ovipositor length about as long as forewing length.

Male.—Length, 8–10 mm. Color and structure as for female.

Records.—SRI LANKA: *Amparai District*, Ekgal Aru, 12-VI-1976, K.V. Krombein, P.B. Karunaratne, S. Karunaratne (1 ♀); Ekgal Aru, 100 mtrs, Reservoir Jungle, 19-22-11-1977, K.V. Krombein, P.B. Karunaratne, P. Fernando, D.W. Balasooryia (1 ♀), 11-12-VI-1976, K.V. Krombein, P.B. Karunaratne, S. Karunaratne (1 ♀); Lahugala Tank, 14-15-VI-1976, K.V. Krombein, P.B. Karunaratne, S. Karunaratne (1 ♀). *Anuradhapura District*, Padaviya Tank, 180 ft., 20-21-V-1976, K.V. Krombein, P.B. Karunaratne, S. Karunaratne, D.W. Balasooryia (1 ♀, 1 ♂); Padaviya, 180 ft., Irrigation Bungalow, 18-V-1976, K.V. Krombein, P.B. Karunaratne, S. Karunaratne, D.W. Balasooryia (1 ♀). *Colombo District*, Labugama, 23-24-VI-1975, S.L. Wood & J.L. Petty (2 ♀). *Kandy District*, Hasalaka, 140-170 m, 15-17-IX-1977, K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, M. Jayaweera (1 ♀). *Kegalla District*, Kitulgala, Makande Mukalana, 3-4-II-1979, K.V. Krombein, P.B. Karunaratne, T. Wijesinhe, S. Siriwardane, T. Gunawardana (1 ♂). *Polonnaruwa District*, 25 mi NW Polonnaruwa, 11-VI-1975, S.L. Wood & J.L. Petty (2 ♀); N. Central Province, Ritigala Nat. Reserve, 8 mi NW Habarana 8-II-1962. Loc. 546:I, swept on grass in forest, Lund University Ceylon Expedition 1962, Brinck-Anderson-Cederholm (1 ♀). *Puttalam District*, 17 mi SE Puttalam, 18-VI-1975, S.L. Wood & J.L. Petty (2 ♀). *Ratnapura District*, Uggalkaltota, 350', 20-VI-1976, K.V. Krombein, P.B. Karunaratne, S. Karunaratne (1 ♀); Gilimale, Induruwa Jungle, 5-7-11-1977, K.V. Krombein, P. Fernando, D.W. Bala-

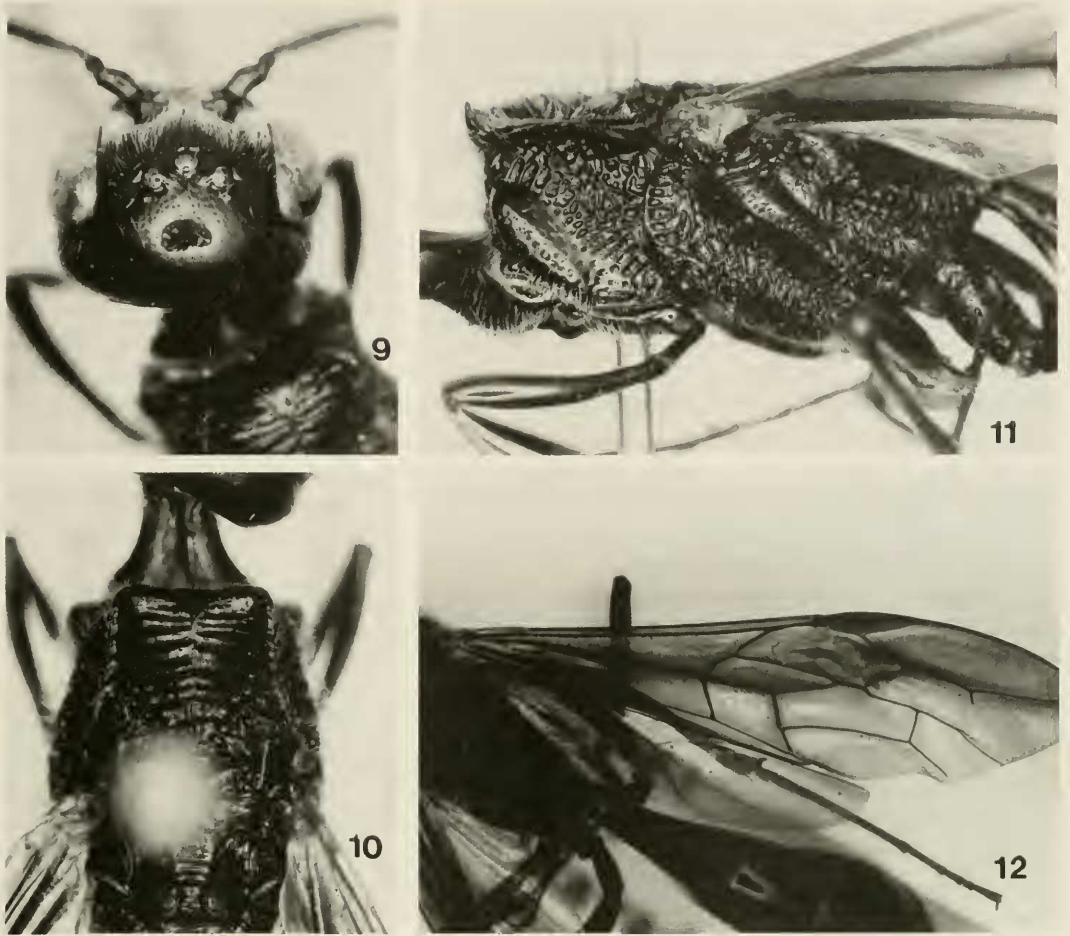
sooryia, V. Gunawardane (1 ♀). *Trincomalee District*, China Bay Ridge Bungalow, 0-50 feet, 24-25-VII-1978, K.V. Krombein, T. Wijesinhe, V. Kulasekare, L. Jayawickrema (1 ♀, 2 ♂); Trincomalee, China Bay Ridge Bungalow, 25-50 ft., 26-II-1979, K.V. Krombein, T. Wijesinhe, S. Siriwardane, L. Jayawickrema, T. Gunawardane (2 ♀), 0-100', 13-17-V-1976, K.V. Krombein, P.B. Karunaratne, S. Karunaratne, D.W. Balasooryia (1 ♀), 16-17-V-1976, same collectors (1 ♀); Trincomalee, China Bay, 1-30 m, 8-11-X-1977, collected near ridge bungalow, K.V. Krombein, P.B. Karunaratne, P. Fernando, T. Wijesinhe, M. Jayaweera (1 ♀), in Malaise trap, same date and collectors (1 ♀).

Type.—The type is presumably lost. It was not found in The Natural History Museum, London (A. Shinohara, correspondence).

Discussion.—Shuckard's type was not found. His description is very brief: "Niger: scapo antennarum pedibusque 4 anticis rufo-testaceis: alis hyalinis, macula ad stigma brunnea. Long. 5½ lin. Exp. alar. 9½ lin." The sex is not given and cannot be determined since both sexes are colored similarly. The specimens from Sri Lanka agree with Shuckard's description, and I regard them as *A. signatus*. This species appears to be the most widely distributed species in Sri Lanka and is easily separated from the other two species by the black color with the reddish scape, pedicel, and fore- and midlegs and structural characters as given in the key and as illustrated.

***Pristaulacus krombeini* Smith,
new species
(Figs. 9–12)**

Female.—Length, excluding ovipositor, 16 mm; forewing length, 13 mm; ovipositor length, 15 mm. Black; tegula reddish brown; anterior margin of clypeus, mandible except apex, tarsi, and lateral and ventral portions of first metasomal segment slightly brownish. Forewing with anterior



Figs. 9–12. *Pristaulacus krombeini*. 9, Head, dorsal. 10, Mesosoma, dorsal. 11, Mesosoma, lateral. 12, Wings.

half black, posterior half of forewing and hindwing more hyaline to slightly blackish; veins and stigma black (Fig. 12). Head from above short and narrowing behind eyes (Fig. 9); with widely scattered fine punctures and silvery hairs, each more dense between ocelli and antennae; occipital carina short. Propleuron shining with scattered punctures, similar to top of head. Pronotum with a forward projecting triangular tooth just above its midlength; anterolateral angles of mesonotum scarcely protruding and rounded in dorsal view, directed upward in lateral view, mesonotum with coarse transverse ridges; silvery hairs on mesosoma not obscuring sculpture (mesosoma as in Figs. 10, 11). Hindcoxa with coarse transverse

wrinkles laterally, posterior surface almost devoid of wrinkles. Tarsal claws with 4 teeth, including apical tooth, and a small acute basal lobe. Ovipositor length about $1.2 \times$ forewing length.

Male.—Unknown.

Holotype.—Female, labeled "Sri Lanka: Tri. [Trincomalee] Dist., Tennamaravadi, 18-V-1976, K.V. Krombein, P.B. Karunaratne, S. Karunaratne, D.W. Balasooryia." In the National Museum of Natural History, Washington, D.C.

Etymology.—Named for my colleague, Dr. Karl V. Krombein, Department of Entomology, Smithsonian Institution, Washington, D.C.

Discussion.—The forewing with the an-

terior half infuscated and the posterior half lighter black to hyaline, entirely black coloration, and structure of the mesonotum as shown in Figs. 10 and 11 separate this species from other Aulacidae described from southeastern Asia. A review of the descriptions of other species described from southeastern Asia, especially those from northern India and Indochina, revealed various distinguishing features from *P. krombeini*, especially combinations of coloration, wing maculation, and mesonotum structure. These taxa include *P. beesoni* Turner, *P. iridipennis* (Cameron), *P. nigripes* Kieffer, *P. rufobalteatus* Cameron, *P. rufobalteatus leviceps* Kieffer, and *P. bituberculatus* (Cameron) from the Himalayas of northern India, and *P. emarginaticeps* Turner, *P. excisus* Turner, *P. nigripes* var. *duporti* Kieffer, *P. tuberculiceps* Turner, and *P. tonkinensis* Turner from Indochina.

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